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*On the Place of the Sciences of Mind and Language in the Science of Man.* By LUKE OWEN PIKE, M.A., F.A.S.L.

AMONG the legion of sciences which are necessary to the formation of a Science of Man, there is one which has fascinated philosophers from the earliest dawn of philosophy, and which has advanced only one stage since its birth. So stationary has this unfortunate science been, that there are many who would have us abandon it in despair, and who argue that, where the most powerful intellects of the past have failed, no one can in future expect to succeed. And so deeply seated is this feeling, that by some persons a man who studies psychology is regarded in the same light as a man who believes in the possibility of perpetual motion. Hence it is difficult to say anything upon the subject without fearing that prejudice will put down all that is said either to arrogance or to folly.

Whether this prejudice be well founded or not, it is, I believe, generally admitted that, without a science of mind, a science of man is impossible. All arguments, therefore, for the abandonment of the study of psychology, apply with at least equal force to the abandonment of the study of anthropology; and from this I conclude that the existence of the Anthropological Society necessarily implies an attempt to solve the mysteries of mind.

The object of this paper is to show what I believe to be one or two of the causes of the arrested growth of psychology.

One of the principal causes seems certainly to be man's notion of his own dignity, which prevents him from comparing impartially his own mental endowments with those of the brutes. And this one cause has given rise to a host of prejudices, which in their turn act as so many new impediments to the progress of discovery. Man admits, with reluctance perhaps, that the other *mammalia* approach very near him in construction, and tolerates the science of comparative anatomy. But hint to him that there is a corresponding similarity in the mental constitution of brutes, and he at once feels insulted. Comparative anatomy is bad enough, but comparative psychology is not to be thought of. And yet this sensitiveness is really uncalled for. There is no fear that comparative psychology will fail to exhibit the immense superiority of man to the brutes. It will, should it ever really become a science, show not only that man is above the brutes, but how far he is above them—and this, if I am not mistaken, in no vague terms, but in figures as intelligible as those which mark the difference between sulphurous acid and sulphuric acid. On this subject, I hope, if the Society will do me the honour to listen to me, to say more on a future occasion. For the present, my object is to clear the way by shewing that the difference between the minds of man and of the brute is a difference not of kind, but of degree. Unless this can be proved, comparative psychology, in the sense of a quantitative analysis of different mental phenomena, must of course be given up.

There is not, I believe, any *à priori* reason to suppose that there is a difference of kind between the brute intellect and the human intel-

lect. Whatever difference may exist, must be shewn to exist by evidence, and not taken for granted; and the evidence which bears upon this point will be the basis of comparative psychology, should such a science ever be established.

But, as examples are always preferable to vague generalities, I shall endeavour to show by an example or two what kind of assistance we may expect from comparative psychology, *i.e.* from the comparison of the mental constitutions of man and brute. Could we, for instance, pronounce with certainty that man is the only possessor of a *hippocampus minor* (as was once asserted by Professor Owen), and also the only possessor of "general ideas" (as is asserted by Professor Max Müller), we should have a definite correlation to work upon, from which it might be possible to deduce still more important results. Unfortunately, however, neither of these assertions has been established; nor am I aware that any difference but difference of degree has been ascertained between either the cerebral structure or the mental functions of men and brutes. On the one hand, we find a greater size of brain, a greater number of convolutions, and greater mental power; on the other hand, a less size of brain, fewer convolutions, and less mental power. It may, however, probably be safely asserted that some of the lower types of animal life show higher mental powers than man in proportion to their cerebral and nervous development; this is especially the case among insects, as, for instance, ants, wasps, bees, etc.

It is, I believe, generally, though not universally, admitted that brutes can reason; or, in other words, that the laws of association apply to them no less than to ourselves. And to admit this, is to admit the principle for which I contend—that the intellectual difference between us and them is a difference only of degree. Nor does it seem possible to establish a greater difference between our emotions and theirs. A dog has a sense of shame, which implies what is called a sense of right and wrong, a sense of personal dignity, a sense even of the ridiculous. He is brave, honest, and affectionate; and is not that a good character even for a man? The feelings that may be wanting in one brute are present in another. The cat has the modesty in which the dog is ludicrously deficient. Nay, so conspicuous is the possession of many of our virtues by the brutes, that men have from the earliest times been designated by the name of the animal which seemed to enjoy their particular virtues in the highest perfection. Richard Cœur de Lion and William the Lion are names familiar to every one; the eagle is the most common national emblem; and if philology attributed the Egyptian religious rites to a similar origin, it would not be the wildest prank she has played.

But the best way to establish my position will, perhaps, be to examine the arguments of one of the foremost advocates of the opposite theory. And this examination will best illustrate the bearing of the science of language upon the science of mind.

Professor Max Müller has made these two assertions:\*

\* Lecture ix, *passim*.

1. "The science of language proves that all root-words expressed 'general ideas'—that the first thing named was the 'general idea'.

2. "Brutes have not 'general ideas'; and therefore we have arrived at the true distinction between man and brute, viz. the 'general idea', and the expression of it, neither of which is possible without the other."

I think it may be shewn that the first proposition is an impossibility, and that the second is directly opposed to fact; and I say this after having carefully weighed the evidence, and in spite of my admiration for the whole of the earlier portion of Professor Max Müller's work.

From an unfortunate confusion of terms, it is not at first sight easy to discover precisely what is Professor Max Müller's meaning. Following the custom of a certain school of philosophy, he uses the word "general", sometimes at least, as synonymous with abstract; a practice which Mr. Mill\* characterises, not too strongly, as an "abuse of language", and a "wanton alteration of the meaning of a word". But Professor Max Müller must mean one of three things: that roots were originally all general names, or that they were all abstract names, or that some were one and some were the other. He must mean that classes were named first, or that attributes were named first, or that roots expressed sometimes classes and sometimes attributes. The distinction will be more apparent if we examine two instances. We may suppose that the attribute *whiteness* was expressed by some primary root; or we may suppose that the class *white*, that is to say white objects in general, were so expressed. The difference in the meaning of the two words is thus stated by Mr. Mill.† "Whiteness is the name of the colour exclusively; white is a name of all things whatever having the colour; a name not of the quality whiteness, but of every white object." Snow is white, but snow is not whiteness. Which of these two meanings was expressed by the root, according to Professor Müller?

Let us as a second instance take the word dog. Was this name first given as a name for all dogs, or was some abstract name equivalent to—let us say—"wag-tailiness", given first to a characteristic attribute or quality perceived in dogs, and then transferred to dogs themselves? Or, if this latter alternative be thought too absurd, are we to reject the abstract signification of roots in some cases and retain it in others?

The only way to answer this question will obviously be to examine some of the instances given by the professor himself. But when we attempt to do this, we at once find, in his manner of assigning a meaning to the root, a want of precision which corresponds with the ambiguity in the meaning of the term "general". "*Antrum*," says Professor Müller,‡ "means really the same as *internum*. *Antar*, in Sanskrit, means between and within. *Antrum*, therefore, meant originally what is within or inside the earth or anything else. It is clear, therefore, that such a name could not have been given to any

\* Logic, 3rd edition, vol. i, p. 29.

† Ibid., p. 31.

‡ Lectures on the Science of Language, 3rd edition, p. 382.

individual cave, unless the general idea of being within, or inwardness, had been present in the mind. This general idea once formed, and once expressed by the pronominal root *an* or *antar*, the process of naming is clear and intelligible."

The process of naming the *antrum* may be clear enough, but not the original meaning of *an* or *antar*. Did *an* mean *within* or *inwardness*? Was the pronominal root, in plain English, a pronoun, or was it not? Would the first man who used the word have said, "The cave is *an* (within) the earth", or "The relation in which the cave stands to the earth is that of *an* (inwardness)"? Did *an* express the relation between an indefinite number of pairs of objects in the concrete, or was it a name for that relation in the abstract? To this question no answer is to be found in the immediate context. Common sense might perhaps supply one.

The same remarks apply to the meaning assigned to the root *ku*, from which Professor Max Müller derives *cavea* and *caverna*. "The general idea of covering existed in the mind before it was applied to hiding places."† Possibly so; but was it named first—that is to say, was the attribute of covering abstracted from objects which cover, and named before those objects, or was the name applied first to all objects, as a class, which possessed the attribute of covering? In this case, the Professor seems to imply that the attribute—the abstract—was the first signification of the root. "It," he says,‡ (i.e. the cavern) was called by the root *ku* or *sku*, which conveyed the idea of to cover." Further on§ there is a passage which can admit of no doubt. "It is the same with all nouns. They all express originally one out of the many attributes of a thing; and that attribute, whether it be a quality or an action, is necessarily a general idea."

By general ideas, then, I think we are justified in concluding that the professor means abstract ideas; and all roots, according to him, expressed abstract ideas, and nothing else. The paradoxical character of this theory is the only excuse I have to offer for the foregoing lengthy, and, I am afraid, tedious examination of Professor Müller's illustrations; but it was, I think, necessary, in order to leave no doubt open about his meaning. And now let us consider to what this theory will lead us. Some attribute, no matter what, must have been the first to receive a name; and at that time all other things must have been nameless. Let us now suppose that the first articulate-speaking man has in his mind or upon his lips this first root-word; how is he to make it intelligible to his comrades? Until it is made intelligible, it cannot fairly be called language; and to make an abstract name intelligible without the assistance of other words is, if not impossible, a feat requiring greater ingenuity than most civilised men possess. Here is the problem: on one side is a human being able to articulate one monosyllable signifying an abstract idea, and able also to gesticulate; on the other side, a human being or beings, also able to gesticulate, but without the power of uttering a single articulate significant sound. How is the meaning of the word

+ Lectures, 3d edition, p. 382.

‡ Ibid.

§ Ibid.

to be communicated? I must confess I have tried to find a way out of the difficulty, and have failed. Suppose, for instance, the first speaker wishes to convey that the attribute of light\* or brightness is to be conveyed by the word *luc*. He points perhaps to the sun, and says "*luc*". But what interpretation could the hearer place upon the gesture and the utterance, except that the object pointed out is to be called *luc*? How are the roundness and the heat of the sun to be eliminated from the meaning of the word, while the light only is left behind? Obviously only by a repetition of the word and gesture when other shining objects are in view. But in this case, the particular would have been first named, and the meaning of the name would have been transferred to the general and the abstract. In this particular instance there is a curious difficulty; for, while we must suppose that *luc* meant originally *light*† in the abstract, we are told that *luc-s* (*lux*), the Latin word which expresses that meaning, is equivalent to "*shining there*", *s* being a pronominal suffix. But if there is such a thing as an abstract and general name, *lux* must certainly come under that definition. It means not *shining there* in particular, but shining wherever you please—here, there, and everywhere—it means the attribute of light, not of any particular kind, but of all kinds. We are therefore left to suppose that, although *luc* originally meant light in the abstract, it became necessary in Latin to add something to it, in order to express the idea of light, and that something a pronoun which would have the effect of limiting and particularising the meaning. If so, surely *luc* must have been of more abstract and more general signification than light, though including that idea, and the first founders of language must have had minds of a most scientific character: it would hardly be unreasonable to conclude that they had arrived at the idea of the correlation of forces. But such are the difficulties and contradictions which beset the theory of the abstract signification of roots.

In short, it is impossible to name intelligibly to others what it is impossible to indicate to others; and it is impossible to indicate an abstract idea without previously existing language. That abstract ideas could have first received a name is, then, impossible; and we are therefore justified in concluding that the concrete was the *primum appellatum*. On this subject, Adam Smith makes some excellent remarks. Professor Max Müller has quoted from him, and professed to give his theory in his own words; but has not quoted or answered the following passage. "As neither quality nor relation can exist in abstract, it is natural to suppose that the words which denote them, considered in concrete the way in which we always see them subsist, would be of much earlier invention than those which express them considered in abstract, the way in which we never see them subsist. The words *green* and *blue* would, in all probability, be sooner invented than the words *greenness* and *blueness*; the words *above* and *below* than the words *superiority* and *inferiority*. To invent words of the

\* Lectures, p. 274.

† Professor Max Müller says "to shine". But he does not of course mean the infinitive mood of the verb shine.

latter kind requires a much greater effort of abstraction than to invent those of the former. It is probable, therefore, that such abstract terms would be of much later institution. Accordingly, their etymologists generally show that they are so, they being generally derived from others that are concrete.”\*

But, inasmuch as concrete names may be general names in the true sense of the term “general”, it may be worth while to examine whether roots could have been general names of this kind—whether an indefinite number of objects could have received a common name before that name had been given to one particular object. This is the more necessary, inasmuch as it is possible that Professor Müller may have included names of this kind in his idea of the class “general”. His own language seems to exclude this meaning; but the words of Leibniz, which he adopts, certainly include it, and it alone. “We may, therefore,” he says,† quoting from Leibniz, “assert that the names of individual things were names of species, which were given, *par excellence* or otherwise, to some individual.”

But the second question which this unfortunate confusion of terms has raised, surely answers itself. How could one human being, possessing a language of one word, inform another human being, altogether ignorant of language, that he desired by his one word to signify not one particular object, which he might point out, but an indefinite number of objects, some of which he could point out only on a future occasion, and others not at all? If one object is pointed out, the word must be taken to signify that one object; if several are pointed out at once, as, for instance, a flock of birds, or a pile of stones, it remains uncertain whether the word is applied to the total flock or pile, or to each of the individual objects making up that total, or to the act of flying, or to the shape of the pile. A word could have obtained a definite signification only by being applied first to a single definite object. The names of the species and of the attributes would grow up naturally out of this original word.

In no sense, then, could the first thing named have been a general idea. It must have been concrete and particular. And all the facts of the case really bear out this proposition; though they also bear out a proposition somewhat like that of Professor Max Müller in expression, but essentially different from it in fact. Though it is impossible that attributes could have been named first, it is certain that all things must have been first named from the possession of attributes. To say this, is to say no more than that things received different names because they differed—a truism which no one will be inclined to dispute. But it does not even follow that things were named from the possession of a single attribute. They may have been named, and probably were named, from the possession of many attributes, which made them what they were.

But, it may be said, Professor Max Müller has brought forward the strongest evidence to show that all root-words expressed general ideas. My answer to this is, that the evidence which he has adduced

\* Theory of Moral Sentiments, Basel, 1793, vol. ii, p. 280.

† Lectures, p. 380.

is all on the other side. For, let it be granted that there once was an Aryan language, all the words of which were monosyllabic, what proof have we that these were the original roots of an original language? All that Professor Müller can tell us of them is, that modified, in one way they express the general, in another the particular; in one way the concrete, in another the abstract. He does not pretend to say that Aryan was the original language, or that others may not have preceded it. To maintain that Aryan affords any evidence of the original meaning of root-words is, if we are to accept Professor Müller's etymologies, to maintain that men learned to measure before they gave a name to the moon, studied the phenomena of reproduction before they gave a name to the sun, learned to plough before they named the earth they stood upon, and ascertained that "dust they were, and unto dust they must return", before they named their own species!\*

In addition to this, it is asserted† that the Aryans had attained a civilisation as great as that of the Germans described by Tacitus. If so, it certainly cannot be among such a people that we are to look for the first origin of language.

But the best example of a radical language—of a language in which roots are words—is, according to Professor Max Müller, the Chinese. And in Chinese we find, even by his own showing, that the same word expresses both the abstract and the concrete, and that "the number of imitative sounds is very considerable."‡ In other words, the most primitive form of language is that which offers the strongest evidence against the theory that general ideas formed the basis of all language. The same word, "jin", means "man", "woman", and "humanity". What evidence this fact offers that humanity in the abstract was named before any particular man, it is difficult to discover. "The history of every substantive," says Professor Max Müller,§ "might be cited in support of the view that the particular was first named." To admit this, and to assert at the same time that the general was the first named, is to invert the ordinary process of induction. It would be equally reasonable to argue that, although water has now a tendency to run down hill, it had formerly a tendency to run up hill; that, though the three angles of every triangle are now equal to two right angles, they were formerly equal to less or more; that, though fire now produces the sensation of heat, it formerly produced the sensation of cold.

If the language which is in the most primitive condition affords most instances of onomatopœia, we may surely conclude that onomatopœia had a considerable share in the formation of language. The fact, if fact it be, that the imitative sounds with which we are acquainted have not been fertile in derivatives, does not prove that imitative sounds never had any derivatives. It is quite possible that the imitative sounds originally in use may have become so modified in sound and meaning as to be no longer recognised as imitative, and to be much better adapted for new variations of meaning than those

\* Lectures, p. 387. + Ibid., p. 239. ‡ Ibid., p. 373, note. § Ibid., p. 381.



imitative sounds which have come into use more recently.\* But the statement that no imitative sound or ejaculation has had a large family of derivatives is refuted, in one instance at least, by the root *ma*. This sound is one of the earliest uttered by the infant; and a sound very like it is uttered by more than one of the brutes. In the earliest human life it is the sound of the child crying for the breast. The stimulus of appetite acting upon the vocal organs seems to call forth this sound before, or at least more frequently, than any others. That it has a definite meaning will hardly be maintained. The irritation of nerves consequent upon inanition seeks relief in an articulate sound; but, in the minds of the parents, the sound becomes connected with the idea of the breast. Perhaps the reduplication of the sound *ma-ma* conveys the idea of the two breasts. And the transition of meaning from the two breasts to the mother is not difficult. From this root *ma*, we may trace the various Aryan names for *mother*—the Sanskrit *mātri*, the Greek *μήτηρ*, the German *mutter*, and all their derivatives. It is not unreasonable to suppose that *ma-tu-rus* may have come from the same source, meaning originally “of an age to become a mother.”† There is every probability that the Greek and Latin words for apple, *μήλον* and *malum*, had the same origin; for in Greek, at least, the word is used metaphorically to express the breast. *Μηλοῦχος* is a girdle that confines the breasts. “*Μήνη*, the moon,” says Professor Max Müller, “means the measurer.” Does it not rather mean the mother—the mate of the sun, whom Professor Müller asserts to be the begetter? The Sanskrit *mā*, to measure, may have been derived from the root *ma*, signifying originally mother, and metaphorically the moon. The Latin *mano*, to flow, comes probably from the same root: source and mother are words that may be used metaphorically for each other. Here are a number of words, each of widely different signification, each having a number of derivatives, and each having as good evidence of descent from the common root *ma* as any of the words cited by Professor Max Müller can give of their genealogy. There is as good evidence that the adjective *malic* is derived from the root *ma*, as that earth is derived from the root *ar*; and surely the modification of meaning is as remarkable. The name of an acid in modern chemical science owes its origin to the first cry uttered by an infant unnumbered ages ago. It is not improbable that many more roots might be traced to ejaculations, or cries resulting from emotion, and perhaps even in the cries of the brutes.

The object of Professor Max Müller's line of argument is apparently to prove that there is a fundamental distinction of kind between the intellect of man and the intellect of brute. That the dignity of man must be asserted at any cost seems to be the doctrine of many philosophers. Be it so; but is the dignity of man really asserted by a misstatement of the facts? Surely we, as men, can afford to give the brutes their due; the superiority of man will bear the light

\* “But words of this kind are like artificial flowers, without a root. They are sterile, and are unfit to express anything beyond the one object which they imitate.” (*Lectures*, p. 368.)

† See Horace, *Odes*, iii, vi, 21; and Virgil, *Æneid*, vii, 53.

of day, and needs not to be puffed like the spurious wares of a dishonest tradesman. The largest concessions to the brutes cannot transform a gorilla into a Shakspeare or a Müller; and we may afford to inquire calmly how near to us the brutes approach without fear that the inquiry will bring them any closer.

"The having of general ideas is that which puts a perfect distinction betwixt man and brute. No animal thinks, and no animal speaks, except man. Language and thought are inseparable. Words without thoughts are dead sounds. Thoughts without words are nothing. To think is to speak low; to speak is to think aloud. The word is the thought incarnate." So says Professor Max Müller,\* but this rhapsody amounts to no more than a statement without explanation of the dilemma of Rousseau: "*si les hommes ont eu besoin de la parole pour apprendre à penser, ils ont eu bien plus besoin encore de savoir penser pour trouver l'art de la parole.*"†

This dilemma of Rousseau's has been translated into German by Wilhelm von Humboldt, and quoted again and again as a fine saying. "*Der Mensch ist nur Mensch durch Sprache; um aber die Sprache zu erfinden müsste er schon Mensch seyn.*" Professor Max Müller gives it us both in German and in English; but two propositions which contradict each other cannot prove the origin of language from any source whatever.

"To think is to speak low," says Professor Max Müller, and in that one sentence lies wrapt up the fallacy which makes the brute intellect distinct in kind from that of man. It is assumed that language is the same as articulation, or at least that articulation is necessary to language. If this be so, and if language be necessary to thought, no deaf and dumb person can think—a proposition which will certainly not be maintained. That articulate language facilitates thought more than some other kinds of language no one will dispute. But it does so because it serves as a mental shorthand, just as algebra shortens the process which might, perhaps, if there were sufficient time, be performed, though with infinite labour, by ordinary language itself.

It is possibly true that we cannot think without symbols, for the recollection of a thing may stand as the symbol of the thing itself. But all symbols are not language, though all language may consist of symbols. We may invent a symbol for our own use, which we do not intend to make, and which we may be unable to make a means of communication with others. It is probable that brutes think by means of such symbols. For instance, the mental picture of a single cat, dog, man, etc., may serve as a symbol of the whole species. Certainly I succeeded in impressing upon a dog the meaning of the general name cat, which would, I think, have been impossible, had he not possessed some power of this kind. The word became, in his case, I conclude, as in my own, a symbol of the symbol in his mind,

\* Lectures, pp. 390-1.

† *Discours sur l'origine de l'inégalité parmi les hommes*: Panthéon Littéraire. Œuvres de J. J. Rousseau, vol. i, p. 545.

which though itself a cat of some definite size and colour, represented cats of all sizes and all colours.

And symbols may pass through several distinct stages.

1. They may be used by an animal for his own convenience only, in which sense they may be called instrument of thought.

2. They may be used for the purpose of communication (but not in the form of articulate speech), as in communicating ideas of food, danger, game, etc. Both brutes and men use this kind of language. The cawing of the crow, the whistle of the thief, the look of the lover, may all be classed under this head.

3. They may be used in the form of articulate speech and written language.

4. They may take the form of algebraical symbols, and so there may be an algebra of algebra, symbols of symbols, *ad infinitum*.

Can it then be said, that articulate language is necessary to thought with any more justice than that algebra is necessary to thought? Is it not rather the fact that the symbols of language are a convenient help to thought, but only in so far as they are symbols. They are artificial symbols of natural mental symbols. By the latter we are able to think, by the former we are able to communicate our thoughts, and to store up past experience. By language we economise the processes of thought, just as by algebra we economise the use of language.

The general name, then, is but a symbol of a symbol. An individual is mentally made the representative of a class, and stands as a symbol for that class. The general name is a name or a symbol of that symbol. And in the attempt to conceive the meaning of an abstract name, a particular object possessing the attribute named is summoned up as a symbol. Use language how you will, you cannot realise the meaning to yourself without the aid of these mental symbols. It may not always be necessary to translate the symbols of language into the symbols of mind, but, where language has a meaning, it is always possible.

If, then, the having of general ideas mean no more than the faculty of making a particular object serve in the mind as the representative of a class, I am quite at a loss to understand how Professor Max Müller, or his authority, Locke, has discovered that the brutes are without general ideas. That men possess general ideas in any other sense cannot, I believe, be proved; that brutes possess them in this sense we have all the evidence that can be obtained from their actions. Any one who doubts this must have been unobservant of the habits of brutes—must have argued somewhat in this way: "brutes cannot have general ideas, because I should not like to believe that they have; therefore they have not; therefore there is a fundamental distinction of kind between the intellect of man and brute."

In confirmation of my view, I quote from Jesse's *Gleanings in Natural History*\* an instance which Mr. Jesse declares to have come under his own personal observation. "I was one day feeding," he

\* Sixth edition, p. 11.

says, "the poor elephant (who was so barbarously put to death at Exeter Change) with potatoes, which he took out of my hand. One of them, a round one, fell on the floor, just out of the reach of his proboscis. He leaned against his wooden bar, put out his trunk, and could just touch the potato, but could not pick it up. After several ineffectual efforts, he at last *blew* the potato against the opposite wall with sufficient force to make it rebound, and he then, without difficulty, secured it."

Now, had a philosopher done this, we should have been told that he had the abstract (or as Professor Max Müller would say, the general) idea of elasticity. The simple fact is, that both the philosopher and the elephant can recollect past facts, and apply them to present emergencies. Call it what you will—a general idea, an abstract idea, an evidence of the law of similarity,\* an act of reason, or by any other grandiloquent name, the fact is still the same. The elephant did all the philosopher could have done under those particular circumstances; he hit upon a plan for getting the potato, and got it. When Newton applied the motion of the apple to the planets, he performed precisely the same kind of mental operation.

Mr. Jesse gives innumerable cases equally illustrative of brute powers. Many of the stories which he tells may appear incredible; but of those which he tells as coming under his own observation there can surely be no doubt. The others may be true or false, but they are certainly not incredible to any one who has studied the habits of even one or two brutes for a few years; they are incredible only to those *a priori* reasoners who think nothing can be true which is opposed to their particular views.

But suppose we reject all the cases in Mr. Jesse's book, and confine ourselves only to those which Professor Max Müller admits. "When a whale is struck," he says,† "the whole shoal, though widely dispersed, are instantly made aware of the presence of an enemy." What is communicated in this case but a "general" idea—the idea of danger? If the idea of danger is not what the Professor calls a "general idea," his terms are utterly devoid of meaning. He also gives another case still more to the purpose. "A parrot," he says,‡ "will take up a nut, and throw it down again without attempting to crack it. He has found that it is light; this he could discover only by comparing the weight of the good nuts with that of the bad; and he has found that it has no kernel; this he could discover only by what philosophers would dignify with the grand title of syllogism, namely, 'all light nuts are hollow; this is a light nut, therefore this nut is hollow.'"

Now, on what ground does Professor Max Müller imply that a man, under similar circumstances, has the abstract idea of hollowness, and that the parrot has it not? That he does imply this there can be no doubt, when he says that man only has that "faculty of abstraction which is better known to us by the homely name of reason."§ I have failed to discover any attempt to bring evidence

\* See Brain, the Senses, and the Intellect, p. 512.

+ P. 361.

‡ P. 358.

§ Lectures, p. 363.

that a man would discover the hollowness of the nut by that "faculty of abstraction which is better known to us by the homely name of reason," while the parrot would discover it by the different process which "philosophers would dignify with the grand title of syllogism." And I have failed, moreover, to discover that there is any difference in the two processes. All deductive reasoning may be exhibited in the form of the syllogism, but Mr. Mill has clearly shown that all inference is really from particulars to particulars. The process by which the hollowness of the nut is arrived at is of this kind: "This particular nut produces a sensation similar to the sensation produced by a certain other nut or nuts which were hollow; therefore this nut is hollow;" or to adopt the formula of Mr. Mill: "This nut has a mark (lightness) which is a mark of hollowness." Professor Max Müller has, perhaps, another name for this process, but it is generally known by the name of reasoning, and it is the process by which every proposition in Euclid is proved. Until the new name is made known and generally adopted, we are justified in concluding that parrots reason, and if we are to accept the statement that reason and the faculty of abstraction are one and the same, we may declare further that parrots have the faculty of abstraction. It appears to me, then, that by this one sentence Professor Max Müller has destroyed his own case and established mine.

It happens, strangely enough, that Rousseau, in discussing this question, took one of his illustrations from nuts. "Pense-t-on," says he,\* of the monkey, who passes from one nut to another, "pense-t-on qu'il ait l'idée générale de cette sorte de fruit, et qu'il compare son archetype à ces deux individus?" The answer to this question is surely easy enough. There is no evidence whatever that the monkey has the capacity of realising to himself Platonic archetypes in a less or greater degree than man. The probability is that he knows a nut when he sees it, just as much as we do; at all events, all his actions seem to prove that to be the fact. If we say simply that the law of similarity seems to apply to brutes as well as to mankind, we say all that the facts will justify us in saying.

"There is," says Professor Max Müller,† "a petrified philosophy in language, and if we examine the most ancient word for name we find it is *nāman* in Sanskrit, *nomen* in Latin, *namo* in Gothic. This *nāman* stands for gnāman, which is preserved in the Latin cognomen. The *g* is dropped, as in *natus*, son, for *gnatus*. Nāman, therefore, and name are derived from the root gnā, to know, and meant originally that by which we know a thing." He goes on to argue that brutes neither know nor name anything, and that it is an abuse of language to say that they do. In curious contrast to this view are the words which Milton places in the mouth of the Almighty.‡

"Knowest thou not  
Their language and their ways? They also know  
And reason not contemptibly."

A poet's testimony may, perhaps, be thought of little weight in a

\* Discours sur l'origine de l'inégalité parmi les hommes.

+ Lectures, p. 384.

‡ Paradise Lost, b. viii, 372.

question of science, but it is, after all, the poet's imagination which enables the philosopher to discover laws of nature. These words, full of life and nature, are worth far more than the "petrified philosophy" of a questionable etymology.

But let it not be supposed that by any of my remarks I wish at all to detract from the very great abilities of the expounder of the science of language. No one can admire more than myself his philological ingenuity. It is only when he deals with subjects that are less familiar to him, and in which he is probably influenced by the prejudices of a particular German school and of a particular Oxford school, that, as it seems to me, he falls into the pit of self-contradictory dogmatism.

My object has been to show, and to show from the evidence of an adversary, on what footing we may expect the science of psychology to stand; to show that the impassable gulf supposed to yawn between the minds of brute and man is a fable as unfounded as those which stay-at-home travellers tell of unknown lands. When this point is once established, the place which psychology will take in the science of man is easily assigned. Comparative psychology must travel on side by side with comparative anatomy; and each in turn must lend a helping hand to the other. They must necessarily carry with them a whole train of subordinate sciences, one of which is the science of language; but without comparative psychology and comparative anatomy, a science of man is impossible. To neglect those sciences which illustrate man's corporeal nature would be as wise as to study anatomy in the soft tissues, and to ignore the skeleton, to examine the nerves of sensation, and neglect the nerves of motion, or as to study geology simply in the different *strata*, and to ignore the fossils they contain. To neglect those sciences which illustrate man's mental nature would be as wise as to study anatomy in the skeleton and ignore the soft tissues, to examine the nerves of motion and neglect the nerves of sensation, or as to study geology in the fossils and ignore the *strata*. In short, as the highest type of man is the cosmopolite, so the science which is to deal with man in general must be cosmopolitan.

The PRESIDENT observed, that the paper was written in the most liberal spirit, and he was sure they must all have been much interested in listening to it. The author of the paper had told them that comparative psychology showed that man is mentally above the lower animals, and how much, and that in all mental phenomena there is no difference in kind, but that the difference consists altogether in degree. The illustrations brought forward to confirm that view were very numerous and interesting. Man's spiritual pride had hitherto prevented him from recognising that law, if such it might be called,—for the generality of mankind were afraid to look simple facts in the face. The society were, therefore, much indebted to Mr. Pike for the clear statement he had made of his views on this interesting subject, on which there had been a large amount of foolish talk in scientific societies and in the universities.

Mr. BOUVERIE PUSEY observed, that the views of the author of the paper were in accordance with the oldest known conceptions of brute intelligence. In every collection of old tales, it would be found that brutes were made to talk, and were supposed to be influenced by similar motives as men. The same view was supported by the Hindoos and the Egyptians; and the doctrine of metempsychosis was founded on the supposed intelligence of brutes: the opposite opinion was a modern conception.

Mr. REYNOLDS considered that the illustrations adduced of the exercise of reasoning power by animals were indecisive. With respect to the illustration of the elephant and the potatoe, he thought the occurrence might have been altogether accidental. Animals were often seen to blow; and the elephant, irritated at not being able to reach the potato, might have blown through its proboscis without anticipating the effect. The illustration of the parrot and the light nut was also very doubtful evidence of reasoning power. The bird might have found out that the nut was a bad one by its feeling light, and that the nut was not, in fact, a nut, though looking like one.

Mr. ST. CLAIR objected to the paper, that it was rather a refutation of the opinions of Professor Max Müller than an exposition of the subject in general. The science of comparative psychology should be established by independent facts and reasoning. It was not known, he said, that brutes have not abstract ideas, and that they do not form rational conceptions. After alluding to the affirmation of Locke of the same views as Professor Max Müller with respect to abstract ideas distinguishing man from brutes, and of Archbishop Whately on another distinction, Mr. St. Clair proceeded to say, that in an old sermon of Wesley's he showed that brutes are not altogether without reason; and the distinction he drew between man and beasts was, that man is capable of being religious, and that brutes are not. This was strictly true in a philosophical point of view. As to the illustration of the derivation of the word "mama," from the fact that the mother has two breasts, it would not bear examination. If the two breasts of the mother caused the repetition of the sound "ma," and so formed the word "ma-ma," the same cause could not apply to the formation of the word "pa-pa," which infants utter as readily as the former, though the breasts in the father are not conspicuous.

The Duke of ROUSSILLON suggested some considerations which he thought favoured the opinions of the author of the paper. He said he had been for a long time engaged in examining the opinions of various writers respecting the origin of a race of men whom he believed to be the most ancient of mankind. That race was called the Scythians, but the meaning of the word was lost. Fifteen hundred years before Ninus, the Scythians were in possession of Asia. There was no certainty respecting the time when that king reigned; but it appeared from all authorities on the subject, that it could not have been later than twelve hundred years before Christ. Some writers represented it to have been eighteen hundred years; but taking it to have been fifteen hundred for round numbers, it was evident that the Scythians were an organised society three thousand years before Christ, as at that time they were enabled to rule over Asia Minor. It was, there-

fore, nearly certain that there was a population in existence at that early period, who possessed laws, arms, organisation, and all the necessary appliances to enable them to fight and conquer. When they thus had before them a race who existed in a civilised condition four thousand eight hundred years before our time, it became a matter of great interest to ascertain what were the characteristics of that race. Certain authors were of opinion that they were the Mongolian race, and there is at the present time an author who says they were of the Caucasian race. He had carefully examined the evidence on this subject, and he intended shortly to publish his opinions, and the results of his investigations respecting it. He would now merely state that the Scythians had light hair, fair eyes, and a fair skin, and that from them were descended the Scandinavians, the Germans, the Slavonians, and many other nations.

Mr. REDDIE said he should be sorry if the Anthropological Society of London came to the conclusion that there is no great difference between men and beasts. In anatomical construction, indeed, there was some resemblance; but if there was a distinction at all between man and the lower animals, it was chiefly in his possession of an exclusive kind of intelligence. He was not prepared to assert a distinction between man and beasts in all respects, but he did not agree in the opinion that the difference in their mental capacities is only a difference in degree. No reasoning power, properly so called, was evinced by animals. The instance of the sagacity of the elephant which had been adduced was no proof of reasoning power. It was probably only an accidental occurrence. Many better instances of the intelligence of animals might be adduced than that; but they were all of that kind of sagacity which is instinctive as distinguished from rational. It might rather be said that man has the faculty of instinct than that brutes have the faculty of reason, and there could be no doubt that many of our acts are instinctive. Thus, for example, when a stone is thrown at your head, you draw aside to avoid it from instinct, without reflection; and an animal possesses the same instinctive power of getting out of danger. The resemblance between animals and man is not in their having reason, but in man having also instincts. With regard to the origin of language, the illustration of the formation of the word "ma-ma" was not borne out by facts, for more generally the sound "da-da" is the first word that is uttered by an infant. If the development of the breast of the mother had any relation to the number of times the infant said "ma", she would have as many teats as a cow! As to the parrot and the dropped hollow nut, he did not think that illustration afforded any proof of reasoning power. He had seen a parrot crack hollow nuts, and he considered the instance when a parrot refused to do so, to be accidental, or an instinctive action only. He did not perceive any indication of the conception of abstract ideas in the sagacity of animals, or any approach to the power of speech; and, with respect to the antiquity of the notion that animals could talk, it could not surely be gravely intended that a literal interpretation should be given to the fables about talking animals, and to the words put into their mouths! As to the doctrine of metempsychosis, which had also been alluded to by the same speaker, it should be borne in mind that all those who



believed in the transmigration of souls believed also in the grand distinction between men and animals which reason and language create.

Mr. BLAKE adduced an instance of the communication of intelligence between a pilot-fish and a shark of which he was a witness, in about the latitude of Buenos Ayres, many years ago. A shark was observed alongside the ship and attempts were made to catch it. They got a piece of beef and fastened it to a hook, and as soon as it was thrown overboard the pilot-fish came and smelt at the bait. It then went back towards the shark, which continued at the beam of the vessel, and made some communication to it, the result of which was that the shark did not move. This was done several times with the same effect. They then baited the hook with a piece of pork, and the pilot-fish having examined it made its report to the shark, at a distance of more than thirty feet, when instantly the latter came to the stern of the vessel, made a snatch at the pork, which it swallowed, and then swam away with the meat and hook too. This was a fact witnessed by himself, and he should like to know what means of communication subsisted between the two fishes, so that they could thus understand each other.

Mr. C. CARTER BLAKE said the paper was so suggestive and was conceived in so liberal a spirit, that he only objected to some slight details. Mr. Pike had pointed out the difficulty of transmuting a gorilla into a Shakespeare or a Müller; but it was a difficulty of his own creation, for no one ever conceived of such a transmutation. The transmutationist only contended for the probable transmutation of the higher class of anthropoid apes, into the lowest class of human beings. As to the question whether language was inseparable from thought, it might be observed that some inferior races of man had a very low grade of language, and uttered sounds that did not convey distinct conventional ideas. He alluded, in support of that opinion, to the Veddahs, and to the observations of Sir Emerson Tennent to the same effect. In what respect, then, except in degree, did such a language differ from the communication of ideas among animals—such, for instance, as was recognised by the bark of a dog, or the mewing of a cat? For his own part he could not distinguish the difference. The communication of ideas by peculiar sounds was especially observable in animals brought under the control of man. It had been stated by Broca, that man might be deprived of the faculty of speech by taking away the second plait of the frontal convolution of the brain; and though, of course, we reject the hypothesis of phrenology in its strict application, there could be no doubt that the faculty of speech has some definite relation to nerve substance. The assertion that the distinction between man and brutes consists in his being a religious animal would not bear examination, for there are many tribes of savage men who have no idea of a God or of a future state; he therefore objected to that definition of man. He wished strongly to express the belief that the distinctions between man and brutes do not depend on moral or psychological forms of classification, but that it must depend on anatomical observation of some positive fact. He had no sympathy with those who, admitting man's physical sameness with the inferior animals, wish to give to man an immaterial substance

different from that which animals possess, yet do not show in what that difference consists.

Mr. WALLACE observed, in reference to the distinction drawn by Mr. Reddie between reason and instinct, that what is called instinct is generally the result of experience which forms a habit that is in time called instinctive. Alluding to the illustration of sagacity in a parrot in detecting a bad nut, he said that he knew a still better instance of apparent intelligence in a parroquet which he had. The bird was very fond of sugar, but could only take it when moistened, and when a dry lump of sugar was given to it, the bird dipped the sugar into water before attempting to eat it.

Mr. PIKE, in replying to the observations that had been made on his paper, said it was satisfactory to find that almost every one of the speakers had agreed to his main proposition. Mr. Reynolds had objected to the illustration of the elephant and the potato, that it was a mere assumption that the elephant reasoned on the effect of his blowing, and suggested that the rebound of the potato from the wall was merely an accident. But if so, it was a remarkable chance that the force of the elephant's breath should drive the potato against a particular point of the wall so that it should come back for him to catch it. Allowing, however, that to have been accidental, there were numerous other instances of sagacity in elephants which had given them the character of being reasoning animals. As to the parrot and the hollow nut, whatever might have been the means of indication still it was an act of reason so long as the bird did not crack the nut. Mr. St. Clair had objected to the paper on the ground that it was principally occupied with a refutation of the opinions of Professor Max Müller; but he (Mr. Pike) had selected that gentleman as the foremost of the class of reasoners who supported certain views. With respect to the instances of derivatives from the root "ma," the objections that had been raised to the derivation from it of the word "mama" did not refer to a fundamental point of the argument, for he suggested the connection of the repetition of the sound and the two breasts of the mother, merely as a conjecture. Mr. Reddie had accused him of saying there is no distinction between man and brutes; but what he said was directly contrary. He had stated "there is no fear that comparative psychology will fail to exhibit the immense superiority of man to the brutes." Mr. Reddie further asserted that no true instance had been adduced of reasoning power in brutes, and that they acted only from instinct. This objection seemed to resolve itself into a question of definition of terms. But it appeared to him that if an act performed by man was considered an act of reason, a similar act by a brute must also be so considered. In all such cases of what is called instinct, the fact is, that they are the results of experience applied by the faculty of reason. With respect to the observations of Mr. Carter Blake on what he had said about the transformation of a gorilla into a Shakespeare or a Müller, there was a little misapprehension. He was merely answering the opinions of other people, for nothing could be further from his own opinion than such a transmutation. The question of a common origin it was not necessary to enter into